University of Richmond
UR Scholarship Repository

Honors Theses | Student Research

4-28-2023

# Food Related Intrusive Thoughts: A Pilot Study

Hoor Ul Ain
*University of Richmond*, hoorul.ain@richmond.edu

Follow this and additional works at: https://scholarship.richmond.edu/honors-theses

 Part of the Experimental Analysis of Behavior Commons, Health Psychology Commons, and the Human Factors Psychology Commons

## Recommended Citation

Ain, Hoor Ul, "Food Related Intrusive Thoughts: A Pilot Study" (2023). *Honors Theses*. 1676.
https://scholarship.richmond.edu/honors-theses/1676

This Thesis is brought to you for free and open access by the Student Research at UR Scholarship Repository. It has been accepted for inclusion in Honors Theses by an authorized administrator of UR Scholarship Repository. For more information, please contact scholarshiprepository@richmond.edu.

# Food Related Intrusive Thoughts: A Pilot Study

by

Hoor Ul Ain

Honors Thesis

Submitted to:

Department of Psychology
University of Richmond
Richmond, VA

28/04/2023

Advisor: Dr. Laura Knouse

**Abstract**

Food related intrusive thoughts (FRITs), a type of intrusive thoughts, might be associated with greater frequency of food intake, greater anxiety and distress, and negative affect in general. However, little is known about the experience of FRITs in the moment. I hypothesized that (1) momentary food related intrusive thoughts or FRITs would be positively related to momentary negative affect and (2) that time since eating will moderate this relationship such that people with more time since eating will show a stronger positive relationship between FRITs and negative affect. These relationships were not found to be significant; however, there was a trend toward people who reported more FRITs in general also reporting more negative affect (although not necessarily at the same moment). Additionally, exploratory analyses showed that reporting more FRITs in general was also significantly related to positive affect. Ecological Momentary Assessment was helpful in detecting FRITs in college students in the moment as 19% of our EMA surveys reported FRITs. It is important to consider that FRITs might occur without significant negative or positive affect in the moment level which might make their detection more difficult.

*Keyword:* intrusions, food intrusions, disordered eating, ecological momentary assessment, affect, cravings, multilevel modeling, college students eating

# Food Related Intrusive Thoughts: A Pilot Study

Intrusions are distinct, identifiable, cognitive events that are unwanted, unintended, and recurrent, interrupt the flow of thoughts, interfere with task performance, are associated with negative affect, and are hard to control (Clark and Rhyno, 2005). Some examples of intrusive thoughts could be constantly ruminating about whether one locked the front door of their house before leaving for work in the morning, if the gas was left on in the kitchen, if an important email was never sent and is still left in drafts, and even if the alarm was set before plugging the phone into the charger across the room. Any of these thoughts could be classified as intrusions if they are recurrent, unintended, hard to control, and bring about negative affect. While over 80% of the population experiences intrusions at times (Wells & Morrison, 1994) and anyone might have experienced the aforementioned examples, intrusive thoughts can become pathological and a sign of clinical symptoms if they are more frequent, more intense, last longer, cause more discomfort, and bring about an effort to suppress the unwanted thoughts (Salkovskis & Harrison, 1984; Purdon, 2004). Freestonet et al. (1994) found that disapproval towards one's intrusive thoughts increased the frequency of them, the effort spent eliminating them from one's mind, as well as the guilt feelings they brought about. Arnaez et al. (2021) conducted a study on illness related intrusive thoughts and found that patients scored higher on the frequency of the most upsetting thoughts, their emotional negative impact, and increased use of maladaptive strategies to resist them. These thoughts also play a significant role in many clinical conditions such as anxiety disorders, especially Obsessive-Compulsive Disorder, Post-Traumatic Stress Disorder, eating disorders, etc. (Roncero et al. 2011).

Food related intrusive thoughts (FRITs) are a type of intrusive thought that is largely understudied compared to other types of intrusive thoughts. These are intrusive thoughts about

specific foods and eating those foods. For example, a food related intrusive thought could be a recurrent thought about eating dinner, especially if one has skipped lunch for the purposes of restricting their food intake. According to Roncero et al. (2011), engaging in FRITs is pleasurable at first as the mental exercise is similar to eating the food that one is thinking about. They believe that this might make the individual think about food more often, making their cravings stronger, and that if their cravings cannot be satisfied, this creates an internal conflict and distress. The person must satisfy the craving in the form of a compulsion or redirect by suppressing, which ultimately leads to an episode of intrusions in the future. Roncero et al. (2011) coined the term Eating Disorder Related Intrusive Thoughts or EDITs i.e., intrusive thoughts about the images, or impulses related to eating disorders, dieting, purging, exercising, intrusions about food, one's body shape, weight etc. as a category under which FRITs could fall. Considering that the current study focuses specifically on intrusive thoughts about food, I use the term Food Related Intrusive Thoughts or FRITs to describe this phenomenon.

While FRITs are understudied, research on traits that are associated with eating disorder symptoms or ideation may be relevant to understanding who is at risk to experience FRITs. Several studies have shown a link between eating disorder symptoms such as food related intrusions in individuals that have high paternal psychological influence (Costa et al., 2016). There is also correlation between one's eating self-efficacy i.e., one's belief in their ability to self-regulate eating, and general affect. For example, Rhee et al. (2013) found that overweight children who perceive their mothers to have firm control in their upbringings have lower eating self-efficacy when they feel sad. Self-compassion can play a role on the person level as well. Self-compassionate people are less likely to suppress their emotions (Turk and Waller, 2020) which, as mentioned previously, is a common effect of eating and food-related intrusions

(Salkovskis & Harrison, 1984; Purdon, 2004). At the same time eating disorder symptoms are inversely related with self-compassion in clinical as well as non-clinical samples. (Ferreira et al., 2013). People with chronic stress may experience more food cravings and thoughts as well due to sensitivity to rewarding substances and behaviors, indicating that historically oppressed groups and people that have experienced challenging circumstances like unemployment, divorce, discrimination etc. might be more susceptible to food cravings on a pathological level (Chao et al., 2015). There is also evidence to suggest that childhood bullying and abuse are related to eating disorder symptoms for both the bullies and victims (Copeland et al., 2015) which might be correlated with FRITs.

It is helpful to understand what the experience and consequences of FRITs may look like in the moment to better understand when it may be pathological for college students. Wegner et al. (1987) came up with the ironic processing theory that essentially shows how suppressing unwanted thoughts brings about an ironic increase of that very thought. He provided the example of a white bear and how asking someone not to think about a white bear will end up making them think about the white bear more than an average person who was not asked to suppress their thoughts. Several researchers have since contributed to the body of work about the experience of food related thought suppression in the moment. Erksine (2008) found that asking participants to suppress their thoughts regarding chocolate made them consume significantly more chocolate than those who were allowed to verbalize their thoughts. This makes one consider a possible post-suppression rebound effect of food related intrusive thoughts in the moment. In fact Mann & Ward (2001) found that participants thoughts about food increased whether they chose what food they would avoid or if the researchers chose for them. Interestingly, this did not increase in over-eating of ‘forbidden foods’ which signifies that a post-

suppression rebound effect could mean a rebound of thoughts, not necessarily behaviors. Furthermore, Soetens and Braet (2006) also found that there can be an increase in food thoughts after suppression if one is a high restrictor.

Cravings are an important characteristic of the experience of FRITs in the moment as well. The Elaborated Intrusion Theory helps shed light on how a FRIT might trigger craving without affecting the psychological states of appetite or hunger (May et al, 2012). One begins to anticipate satisfying the craving as it is tied to our reward system. In fact, the cravings about food are elaborated with mental sensory imagery. May et al. (2008) found that the vividness of mental imagery was the only variable that predicted the intensity of craving in their participants. Mindfulness strategies that target imagery are found to reduce cravings (Schumacher et al., 2017) and excess imagery as part of these mindfulness strategies might even cause satiation once the image loses its emotional power after habituation (Hetherington et al., 1989). This helps put into perspective the power of imagery in FRITs. In general, meditation has been found to reduce mental imagery and cravings as the person experiencing FRITs becomes pre-occupied with other tasks competing in their working memory (May et al., 2012).

The onset of intrusive thoughts has also been linked with negative urgency. This refers to the tendency to act impulsively in order to reduce one's negative affect and can involve maladaptive strategies like purging, binging, or restricting. Individuals showed a significant correlation with negative urgency and bulimia symptoms and attitudes (Wenzel et al., 2014). At the same time, positive urgency is the tendency to respond impulsively to positive affective states. The findings on positive urgency in the moment are contrasting as several researchers find that is correlated with over-eating (Bongers et al., 2013) while others have not found differences between neutral and positive feelings in terms of over-eating, binge-eating, and emotional eating

(Macht & Simons, 2000, van Strien et al., 2013). Thus, there might a role of negative urgency in the experience of FRITs which makes one question how significant the impact of negative affect would be.

While there is not a lot of research on affect in the moment for people experiencing food related intrusive thoughts, there is evidence that implies a link between the two variables. People who tend to suppress their intrusive thoughts or those in high disinhibition conditions experience more anxiety and distress in relation to suppressing their food related thoughts (Oliver et al., 2001). Stressed emotional eaters also consume meals greater in energy, calories, richness, and sweetness than unstressed and non-emotional eaters (Oliver et al., 2000). Whiteside et al. (2006) also found a link between not being able to regulate and identify negative moods and binge eating in participants. Therefore, one can conclude that affect might play a role in FRITs in the moment although no prior study has examined this question.

Ecological momentary assessment or EMA involves using repeated sampling of current behaviors, emotions, and experiences in the moment while the participant is in an environment that is natural to them (Shiffman et al., 2008). It can fill in the gaps about what is currently known about eating intrusions by showing whether participants experience FRITs at certain times and what other characteristics are associated with those time points. The data points acquired are on a person level, day level, and moment level and thus one can predict if a factor such as negative affect at a certain time point is related to another factor like eating behavior in the same moment or at another time point. Other researchers have used EMA to study eating intrusions in the past; for example, Richard et al. (2017) used EMA to look at craving intensity and consumption of snacks. They found that high trait food cravers thought more often about high-calorie snacks and that higher craving intensity was related to more consumption of snacks.

Additionally, Shingleton et al. (2013) looked at binge/purge thoughts using EMA as well. However, there is no prior work on FRITs and their association with affect in the moment using EMA which makes the current study novel and fills a significant gap in literature.

Therefore, my research questions are (1) How are FRITs (when not eating) associated with negative affect in the moment and (2) if that relationship is moderated by time since eating. Considering that there is previous research on the association between intrusive thoughts and general negative affect, I hypothesize that (1) FRIT will be positively correlated with negative affect in the moment. While there is no prior research to our knowledge about time since eating impacting a stronger post-suppression rebound effect, I also hypothesize that the relationship between FRITs and affect will be moderated by time since eating such that the positive relationship between negative affect and FRITs will increase as time increases after eating.

## Methods

### Participants

20 participants were recruited from the University of Richmond due to the financial resources available for this pilot study. The mean age of the sample was 20.15 years (*SD* = 1.63). 55% of participants identified as White/Caucasian, 25% as Asian/Pacific Islander/West Asian/Desi/Arab, 5% as Black/African American, 10% as Native American, 5% as other, and 5% preferred not to answer this category. Percentages total to greater than 100% because participants could choose all that apply. In terms of gender, 60% of our sample identified as female, 40% as male, and 10% as non-binary. 35% of the participants were first-generation college students (i.e., neither parent completed a Bachelor's degree), and 75% reported working for pay while in school. See Table 1 for additional sample demographics and descriptive statistics. 35% of our participants were currently or previously diagnosed with an anxiety

disorder at some point in their lives while 30% were currently or previously diagnosed with depression.

The study was advertised via the university's email announcements called Spider Bytes. Participants were selected upon completing a short online screening questionnaire that determined their eligibility for the study. The criteria involved studying on-campus so that students would have access to similar on campus dining options, own a smartphone and a laptop to be able to complete our baseline and EMA questionnaires, be over the age of 18, and be available for the times offered by our lab for the baseline visit conducted via Zoom.

**Table 1**

*Characteristics of Participants*

| **Sample Characteristics** | ***n*** | ***%*** | ***M*** | ***SD*** |
|---|---|---|---|---|
| **Age** | 20 | | 20.15 | 1.63 |
| **Gender** | | | | |
| **Men** | 6 | 30 | | |
| **Women** | 12 | 60 | | |
| **Non-Binary** | 2 | 10 | | |
| **Race** | | | | |
| **White/Caucasian** | 11 | | | |
| **Asian/ Pacific Islander/West Asian/** Desi/ Middle Eastern | 5 | | | |
| **Black/African American** | 1 | | | |
| Native American | 2 | | | |
| **Prefer Not to Answer** | 1 | | | |

| | | | | |
|---|---|---|---|---|
| **Other** | 1 | | | |
| **Mexican/Mexican American/Chicano** | 2 | 10 | | |
| **Another Hispanic, Latino, or Spanish origin** | 1 | 5 | | |
| **Sexual Orientation** | | | | |
| **Asexual** | 2 | 10 | | |
| **Bisexual** | 2 | 10 | | |
| **Gay/Lesbian** | 2 | 10 | | |
| **Heterosexual/Straight** | 11 | 55 | | |
| **Pansexual** | 1 | 5 | | |
| **Queer** | 2 | 10 | | |
| **An Orientation Not Listed Here** | 2 | 10 | | |
| **Prefer Not to Answer** | 1 | 5 | | |
| **Work for Pay** | 15 | 75 | | |
| **First Generation College Student** | 7 | 35 | | |
| **Grade Point Average** | | | 3.79 | 0.28 |
| **Body Mass Index** | | | | |
| **Normal** | 13 | 65 | | |
| **Over** | 4 | 20 | | |
| **Obese** | 1 | 5 | | |
| **Unsure** | 2 | 10 | | |
| **Currently/Previously Diagnosed with Anxiety Disorder** | 7 | 35 | | |

| | | |
|---|---|---|
| **Currently/ Previously Diagnosed with Depression** | 6 | 30 |
| **Currently/Previously Diagnosed with Another Disorder** | 1 | 5 |

**Measures at Baseline**

The following measures were administered at baseline along with questions about demographics, Body Mass Index, and prior clinical diagnoses.

***Psychological Control Scale – Youth Self Report (PCS-YSR; Barber et al., 1996)***

The PCR-YSR is an 8 item self-report scale designed to measure psychological control of parents. Participants were asked to rate their parents from 1 (not like them) to 3 (a lot like them). Evidence of this scale's reliability come from a study by Costa et al. (2016) showing that maladaptive perfectionism can mediate the role between parental psychological control and eating disorder symptoms. Participants' mean score was 1.46 (*SD* = 0.49), which was found to be highly reliable (8 items; α = .86).

***Frost Multidimensional Perfectionism Scale- Brief (FMPS; Burgess et al., 2016)***

The F-MPS-Brief is an 8 item self-report scale designed to measure maladaptive perfectionism. It has two dimensions: striving and evaluative concerns. Participants were asked to rate their answers on a scale of 1 (strongly agree) to 5 (strongly disagree). Evidence of this scale's reliability also come from Costa et al. (2016)'s study about maladaptive perfectionism. Participants' mean score was 2.33 (*SD* = 0.63), which was found to be highly reliable (8 items; α = .76).

***The Self-Compassion Scale – Short Form (SCS-SF; Raes et al., 2010)***

The SCS-SF is a 12 item self-report scale designed to measure adults' capacity for self-compassion. It has two subscales: self-disparagement and self-care. Participants were asked to

rate behaviors they engage in from 1= ‘almost never’ to 5= ‘almost always’. Evidence of this scale’s reliability come from a study by Hayes et al. (2016) who found that scores on the SCS-SF were related to perfectionism, self-harm, suicide, psychological distress, and social support. Participants’ mean score was 3.04 (*SD* = 0.54), which was found to be highly reliable (12 items; α = .74).

***Eating Self Efficacy Brief Scale (ESEBS; Lombardo et al., 2020)***

The ESEBS is an 8 item self-report scale designed to measure eating self-efficacy related to social and emotional situations. Participants were asked to rate on a 6-point Likert scale how easy it is to resist their urges to eat ranging from 1 (not easy at all) to 6 (completely easy). Evidence of this scale’s reliability come from a study by Diotaiuti et al (2022) that was testing the reliability of Tempest Self-Regulation Questionnaire for Eating (TESQ-E). Participants’ mean score was 3.21 (*SD* = 0.82), which was found to have acceptable reliability (8 items; α = .67).

***Food Cravings Questionnaire-Trait-reduced (FCQ-T-r; Meule, Hermann, et al., 2014)***

The FCQ-T-r is a 15 item self-report scale designed to measure intensity of food cravings. Participants were asked to rate their behaviors by responding on a 6-point scale ranging from 1 (never/not applicable) to 6 (always). Evidence of this scale’s reliability come from a study by Meule, Beck, Teran et al. (2014) showing test-retest reliability over 6 months. Participants’ mean score was 2.82 (*SD* = 1.03), which was found to be highly reliable (15 items; α = .95).

***The Eating Attitudes Test (EAT-26; Garner et al., 1982)***

This is a 26 item self-report scale designed to measure presence of eating disorder risk. It has 3 subscales: dieting, bulimia and food preoccupation, and oral control. Participants were

asked to respond on a 6-point scale ranging from 1 (always) to 6 (never). Evidence of this scale's reliability come from a study by Berry et al. (2007) who used the EAT score in their screening for participants. 80% of participants scored less than 20 (considered to be the cut-off for presence of eating disorder) on this scale while 15% higher than 20 and one participant's data was missing. This was also found to be highly reliable (26 items; $\alpha = .86$).

***Experience with Food Related Intrusive Thoughts (FRITs)- Baseline***

These questions were derived to understand participants' general experience with FRITs in a exploratory manner. They were asked how frequently they have thoughts about food when not eating or snacking on a scale of 1 = 'Almost Never to 6 = 'Almost Constantly', and when these thoughts happen: specifically, if they happen before eating, after eating, when looking at oneself in the mirror, in a social context, independent of a specific situation, or another specific event. Most of our participants reported that FRITs occur at 3 (Sometimes). 75% reported them occurring before eating, 20% reported FRITs after eating, 15% when looking at oneself in the mirror, 20% in social settings, and 35% independent of a specific situation. One participant reported experiencing FRITs when using social media. They were also asked about the vividness of these thoughts in terms of touch, taste, sound, and smell of the food in their mind on a scale of 1 = Not very vivid, to 4 = Extremely vivid. 55% of participants reported a 2 = Somewhat Vivid. Then, they rated how much they were trying to suppress their thoughts (45% reported a 2 = A Little Bit), how uncontrollable they were (45% reported 1= Not at All Uncontrollable) , how much they felt like they must act on them (50% reported 2 = A Little Bit), and how distressed or bothered they were by them 50% reported 1= Not at All Distressed) on a scale of 1 = Not at all, to 4 = Extremely/ A Great Deal. Participants were also asked to rate their experience with intrusive thoughts about dieting, exercise, body image, purging, taking laxatives for weight loss,

fasting related to weight loss, cosmetic surgery related to weight loss, weight loss or weight gain supplements, bloating, gut health as it impacts body shape, not being able to stop eating, body checking (repeated checking of one's weight or shape), certain food items, and other relevant food related intrusive thoughts on a scale of 1 = I have never had this thought to 8 = I have this thought frequently throughout the day. Mean score for body image and exercise were the highest with average experience with intrusive thoughts about exercise being 5.68 (*SD* = 1.67) and body image being 5 (*SD* = 1.97). 50% of participants also scored higher than a 4 on intrusive thoughts about bloating (*M* = 3.74, *SD* = 2.45) and dieting (*M* = 3.68, *SD* = 2.08).

**EMA Measures**

The following measures were in each of our EMA surveys sent to participants 5 random times a day for 6 days following the baseline visit. The PANAS was the first question to account for any order effects that could arise because of questions about FRITs impacting affect.

***Positive and Negative Affect Schedule-Expanded form (PANAS-X; Watson & Clark, 1994)***

The PANAS is a 60 item self-report scale designed to measure affect. 14 items were drawn from the expanded form for the ease of our participants to assess their affect at each separate moment. Participants were asked to specify the extent (1 = not at all, 5 = extremely) to which they were currently feeling sad, lonely, jittery, nervous, angry, hostile, happy, excited, down, depressed, hopeless, guilty, ashamed, anxious. Scores for ‘sad’, ‘lonely’, ‘nervous’, ‘angry’, ‘hostile’, ‘down’, ‘depressed’, ‘hopeless’, ‘guilty’, ‘ashamed’, and ‘anxious’ were averaged to yield one score reflecting negative affect in the moment. Evidence of this scale’s reliability come from a study by Mroczek et al. (2015) showing that greater decrease in positive affect increases mortality risk.

***Experience with Food Related Intrusive Thoughts (FRITs)- EMA***

Participants were asked if they were currently eating (1= No, 2= Yes) and if they responded by saying 'Yes', these responses did not count towards FRITs as we were only interested in FRITs when not eating. They were then asked if just before responding to the survey they were thinking about food or snacks at the moment (1= Yes, 2= No) and this question measured our FRITs variable. If they responded by saying 'Yes', they were prompted to other questions that measured different aspects of FRITs. They were able to enter the food related thought itself as a free response, followed by why they believed this thought occurred as another free response, their desire to consume it (1= not at all, to 5= extremely), how much they were trying to suppress the thought (1= not at all, to 5= extremely), how difficult it was to control (1= not at all, to 5= extremely), and how distressing it was (1= not at all, to 5= extremely). Vividness of mental imagery was asked as a 7-point Likert response ranging from 1 (perfectly clear and as vivid as the actual experience) and 7 (no image resent at all, you only 'know' that you are thinking of the object) with categories of hearing, smell, touch, sound, and sight. This is derived from the Questionnaire Upon Mental Imagery—Brief Version (Sheehan, 1967) which assesses imaging ability in the five sensory modalities. They also entered time since eating as a free response in hours and the number of times they had a food related thought since the last survey.

**Recruitment and Screening**

The study was promoted by sending a campus wide email announcement called SpiderBytes. The messaging included the link to the initial screening Qualtrics questionnaire that asked participants whether they are a University of Richmond student, study on-campus, use a smartphone and a laptop, and if they are above the age of 18. If they met these criteria, they were prompted to sign up for a time on youcanbookme.com for the baseline interview which was

conducted on Zoom. Only participants available to meet at times offered by the lab were recruited.

**Procedure**

During the baseline interview visit conducted on Zoom by the primary investigator, participants provided consent, filled out the baseline surveys listed in the measures section, and set up their phones to receive our survey signal EMA texts. This occurred at times offered by the lab. Starting from the following day for the next 6 days, participants received EMA texts 5 times a day at random times within evenly spaced windows from 8 AM to 10 PM They had two hours to respond to each text after which the link became inactive. A reminder text was sent 30 minutes after the initial text. After the 6 days of receiving EMA texts, participants were compensated for their time in the form of a $10 Amazon Gift Code for completing the baseline and post visits and an additional 50 cents for each EMA survey. Participants who completed more than 75% of our EMA surveys were entered into a raffle to win one $50 Amazon Gift Card as well.

**Plan of Analysis**

Multilevel modeling was used to test the key hypotheses. Data was structured within three levels: Moment (Level 1), Day (Level 2), and Participant (Level 3). FRITs at Level 1 were centered within-person (centering within cluster) by subtracting each person's grand mean from each momentary value. When testing the effects of person-centered Level 1 variables, both the within-person centered variable and each participant's mean were included to parse the within vs. between person variance associated with each Level 1 variable and examine the contextual effects. Analyses were conducted in R using the lmer package to conduct multilevel modeling using full information maximum likelihood estimation with random slopes at each level, when possible computationally. First, a null model was calculated to estimate the proportion of

variance at each level. Whether FRITs predict negative affect was tested first followed by whether time since eating predicts negative affect, followed by whether time since eating increases the strength of the relationship between within person FRITs and negative affect--that is, whether there was an interaction on these variables. Specifically, the interaction of time since eating (level 1) and within-person-centered FRIT scores was tested.

## Results

It is important to note that the EMA data had some duplicate surveys. This typically occurred when participants clicked on the survey link in a text message, completed the survey, and then clicked on the link in the reminder text message and completed the survey again. To limit our duplicate EMA surveys, we reminded participants that if they got 2 texts within 30, they only need to do the survey once during our baseline visit. Despite this, 19 duplicate surveys were identified in the dataset (3.6%) and deleted. Surveys were sorted by time and those closer in time to the original survey prompt were kept in the dataset. This resulted in a total of 500 EMA data points from 20 participants, where the number of surveys completed ranged from 2 to 30 per participant with a mean of 24.8 (SD = 7.72). Participants reported eating for 23.6% of the EMA surveys. At times they were not eating, 19% of the EMA surveys reported FRITs while 81% reported not experiencing FRITs. Their desire to consume the food or snack when experiencing FRITs was rated 3.18 (*SD* = 1.06) on average on a scale of 1= not at all to 5= extremely. Vividness of mental imagery was highest in terms of sight (*M* = 3.78, *SD*= 2.15) and taste (*M*= 3.55, *SD*= 2.19) when asked as a 7-point Likert response ranging from 1 (perfectly clear and as vivid as the actual experience) and 7 (no image resent at all, you only ‘know’ that you are thinking of the object).

To estimate variance at each level and thus confirm that multilevel modeling was the appropriate analytic approach for the data, a null model was calculated. 9% of the variance was at Level 2 (day) and 55% was at Level 3, supporting a three-level model. Additionally, to avoid a boundary fit error, in the main analyses, we fixed the slopes at Level 2 for person-centered FRITs.

**Main Effect of FRITs on Negative Affect**

Presence of FRITs (1 = yes, 2 = no) at the moment level was not significantly related to negative affect ($b$ = 0.01, $SE$ = 0.06, $p$ = 0.77) nor was presence of FRITs at the person level ($b$ = -0.85, $SE$ = 0.47, $p$ = 0.08). This signifies that at times when participants experienced more FRITs than typical, they did not significantly experience differences in negative affect. However, at the person level, there was a trend ($p$ = 0.08) toward participants who experienced FRITs more often, in general, also reporting more negative affect in the moment, in general.

**Main Effect of Time Since Eating on Negative Affect**

Time since eating and negative affect were not significantly positively related ($b$ = 0.003, $SE$ = 0.004, $p$ = 0.42). This implies that participants did not experience significant negative affect if more time passed since eating.

**Effect of Time Since Eating Moderating the Relationship Between FRITs and Negative Affect**

Time since eating did not significantly moderate the relationship between FRITs at moment level and negative affect ($b$ = -0.005, $SE$ = 0.01, $p$ = 0.59). This means that the relationship between FRITs and negative affect was not significantly moderated by how much time had passed since they last ate.

**Exploratory Analyses**

Several analyses were conducted on an exploratory level. I tested the main effects of FRITs and time since eating as well as their interaction on positive affect and the effects of these variables on a modified negative affect score. Specifically, scores for 'sad', 'down', 'depressed', 'hopeless', 'guilty', 'ashamed', and 'anxious' were averaged to yield a new score reflecting negative affect in the moment. This was done to help clarify what negative affect questions were related to FRITs and/or time since eating, if any. Scores for 'happy' and 'excited' were averaged to yield a new score reflecting positive affect in the moment. Finally, I tested whether scores on the EAT scale were related to momentary negative affect and whether EAT scores moderated any relationships between time since eating and affect.

**Main Effect of FRITs on Positive Affect**

Presence of FRITs (1 = yes, 2 = no) at the moment level was not significantly related to momentary positive affect ($b$ = -0.013, $SE$ = 0.09, $p$ = 0.17). However, presence of FRITs at the person level was significantly related to positive affect ($b$ = -01.49 $SE$ = 0.73, $p$ = 0.048). This signifies that at times when participants experienced more FRITs than typical, they did not experience significantly different level of positive affect. However, participants who generally reported more FRITs, were more likely to report more positive affect in a given moment.

**Main Effect of Time Since Eating on Positive Affect**

Time since eating and positive affect were not significantly related ($b$ = -0.006, $SE$ = 0.01, $p$ = 0.47). This implies that participants did not experience significantly different positive affect if more time passed since eating.

**Effect of Time Since Eating Moderating the Relationship Between FRITs and Positive Affect**

Time since eating did not significantly moderate the relationship between FRITs at moment level and positive affect ($b$ = 0.008, $SE$ = 0.02, $p$ = 0.68). This means that the relationship between FRITs and positive affect was not significantly moderated by how much time had passed since they last ate.

**Main Effect of FRITs on New Negative Affect Score**

Presence of FRITs in the moment was not significantly related to negative affect ($b$ = 0.05, $SE$ = 0.06, $p$ = 0.44) nor were participants' general frequency of FRITs (person level) ($b$ = -0.77, $SE$ = 0.57, $p$ = 0.18). This signifies that at times when participants experienced FRITs, they did not significantly experience more negative affect, and this was true for each person's average experience of FRITs.

**Main Effect of Time Since Eating on New Negative Affect Score**

Time since eating and negative affect were not significantly related ($b$ = 0.002, $SE$ = 0.005, $p$ = 0.72). This implies that participants did not experience significantly different negative affect if more time passed since eating.

**Effect of Time Since Eating Moderating the Relationship Between FRITs and New Negative Affect Score**

Time since eating did not significantly moderate the relationship between FRITs at moment level and negative affect ($b$ = -0.01, $SE$ = 0.01, $p$ = 0.36). This means that the relationship between FRITs and negative affect was not significantly moderated by how much time had passed since they last ate.

**Main Effect of EAT Score on Negative Affect and Moderation of FRITs**

People with a higher EAT scores (person level) reported significantly higher negative affect in the moment (original negative affect score; $b$ = 0.03, $SE$ = 0.01, $p$ = 0.003). This

signifies that when participants with higher EAT scores filled out EMA surveys, they experienced significantly greater negative affect. EAT scores, however, did not moderate the relationship between momentary FRITs and negative affect ($p$ = .17).

## Discussion

The study found that FRITs at the moment level were not significantly related to negative affect ($b$ = 0.01, $SE$ = 0.06, $p$ = 0.77) nor were FRITs aat the person level ($b$ = -0.85, $SE$ = 0.47, $p$ = 0.08). Additionally, time since eating did not significantly moderate the relationship between FRITs at moment level and negative affect ($b$ = -0.005, $SE$ = 0.01, $p$ = 0.59), all contrary to the hypotheses. However, for FRITs at the person level, there was a trend ($p$ = 0.08) toward participants who experienced FRITs more often, in general, also reporting more negative affect in the moment. Additionally, while presence of FRITs at the moment level was not significantly related to positive affect ($b$ = -0.013, $SE$ = 0.09, $p$ = 0.17), exploratory analyses showed that the presence of FRITs at the person level was significantly related to positive affect in the moment ($b$ = -0.1.49 $SE$ = 0.73, $p$ = 0.048). This signifies that participants who generally experienced more FRITs were more likely to report positive affect in any given moment.

EMA was used as a tool to collect data on FRITs in the study. This allowed participants to report when they were eating and if, at the times they were not eating, they were experiencing FRITs. As mentioned in the results section, participants reported eating for 23.6% of the EMA surveys. At times they were not eating, 19% of the EMA surveys had reported FRITs. It is important to consider that even non-clinical samples are experiencing these food-related intrusive thoughts which might be distressing, time-consuming, and recurrent, potentially making focusing on school-work difficult for college students. EMA was thus found to be a helpful tool in detecting FRITs especially as they are not associated with significant negative

affect in the moment. Collecting data at random time points also provides strength to the conclusions and allowed analyses across multiple time points. Using EMA helped fill in a gap about what is currently know about FRITs by showing us that participants did experience FRITs, that people who reported more FRITs also reported more positive affect in general, but that affect was not significantly associated with FRITs at the same time points. While other researchers had used EMA and eating intrusions in the past there was no prior work to our knowledge on FRITs and their association with affect in the moment using EMA. This makes the current study novel and fills a significant gap in literature.

The study also allowed for the collection of qualitative data through the baseline and EMA questionnaires which help provide examples of FRITs as this is a new area of study. For example, in the Experience of FRITs question in the baseline, participant reports included: “I am worried about what ingredients might be in foods, and what textures, smells, and tastes there will be like, and new foods make me nervous because I don’t know these things.” and “I have worries about not having enough access to food at home.” Another participant expressed not being able to identify specific FRITs, “Sometimes, I crave something I can’t identify, and I’ll spend a while scrolling though Grub Hub or the D Hall menu, but nothing seems right/ seems like it will satisfy it.” These show some of the diverse kinds of FRITs college students might experience.

Additionally, responses to the EMA surveys also help provide context for FRITs as well. One participant reported in an EMA survey, “I want to eat breakfast because food is tasty, but I ate too much last night. I’m going to have to skip breakfast. Maybe lunch.” Similarly, “I have ice-cream in my fridge and I kind of want it but I ate less than an hour ago so I shouldn’t right now.” Another reported. “If I should skip breakfast or eat something.” Some of the reasons expressed for experiencing FRITs were due to not having eaten or had very little to eat all day, or while

being ‘bored’ or ‘stressed’ in class. Another common theme in EMA responses was ruminating about friends making plans for meals or talking about food which brought about FRITs in participants.

The trend of more frequent FRITs being generally associated with higher negative affect is a replication of previous research regarding FRITs. As mentioned before, according to Clark and Rhyno (2005) people that experience intrusive thoughts also experience negative affect greater than those who do not. Additionally, Whiteside et al. (2006) also found a link between negative mood and disordered eating behaviors and ideology in participants. Therefore, the current study adds to the existing literature about FRITs.

Previous research also indicated that the findings on positive urgency and affect when it comes to FRITs were contrasting. Several researchers found that positive urgency is correlated with disordered eating symptoms and ideations while others had no found differences between neutral and positive feelings. The current study adds to the body of work on the topic of positive affect and FRITs by showing that at times when participants experienced FRITs, they did not significantly experience more positive affect ($b$ = -0.013, $SE$ = 0.09, $p$ = 0.17). However, participants who reported more FRITs did generally report greater positive affect ($b$ = -0.1.49 $SE$ = 0.73, $p$ = 0.048).

Although no significant association between FRITs and negative affect in the moment was found, people with more frequent FRITs trended towards reporting greater negative affect in the moment ($b$ = -0.85, $SE$ = 0.47, $p$ = 0.08). In addition, a new negative affect score was also calculated on an exploratory level comprised of a subset of the affect items included in the originally planned score, but no associations between FRITs and negative affect were detected. This could mean that there is a relationship between FRITs and affect but perhaps it is across

time such that FRITs at time point 1 are a predictor of negative affect at time point 2. It could also mean that there is another variable that mediates the relationship between FRITs and negative affect such as one's EAT score, which is a common assessment tool for presence of eating disorders. An exploratory analysis did show that people with a higher EAT scores at baseline had significantly greater negative affect in the moment ($b = 0.03$, $SE = 0.01$, $p = 0.003$), but EAT score did not moderate the relationship between FRITs and negative affect. It is also possible that negative affect in the moment could be better measured by questions that are more relevant to FRITs and/or time since eating, which was beyond the scope of the current study.

There are also some other explanations as to why the results were not significant. As this was a pilot study with limited resources, the sample size was small with only 20 participants. This also affected the multi-level model as there may not have been enough EMA surveys to show a significant relationship between the variables. In fact, slope at Level 2 was fixed for person-centered FRITs to avoid a boundary fit error suggesting that this pilot study may not have been sufficiently powered for these complex analyses. Additionally, while the Eating Attitudes Test or EAT was included in the baseline questionnaire, it was not used in the exclusion criteria due to the exploratory nature of the study. The EAT is a common tool used to diagnose presence of eating disorders. Rivas et al. (2013) explored whether the EAT score would discriminate between clinical and community samples and found that it demonstrated good specificity in doing so. Future research might involve excluding participants that do not have disordered eating behaviors and cognitions as this might lead to a significant association between FRITs and affect in the moment.

The study has the limitation of relying solely on self-report and piloting untested methods for trying to elicit reports of FRITs. While using Ecological Momentary Assessment mitigates a lot

of possible retrospective bias as it focuses on what is occurring in the moment instead of the past, it is still a relevant bias to consider. It is also possible that the participants did not understand what FRITs exactly are. Presence of FRITs was operationalized via the question 'Just before responding to the survey, were you currently thinking about food or snacks?'. This did not necessary mean that what they reported was an intrusive thought. At the same time, if participants were given examples or provided with literature about intrusive thoughts or FRITs, it could have biased their EMA responses in the direction that was hypothesized. The current study tried to balance preparing participants for the experience of filling out EMA surveys 5 times a day for 6 days in the baseline visit while also being ambiguous about the aims of the research.

As food related intrusive thoughts were not significantly related to negative affect in the moment, but where significantly positively related to positive affect only at the person level, the results signify that food related intrusive thoughts could occur without a significant momentary increase in positive or negative affect. This might make it difficult for college students to identify that they might be experiencing FRITs and to seek support for anxiousness or disordered eating cognitions. Future research should investigate how college students self-identify FRITs or whether they are even aware of them outside of being promoted by an EMA survey. One could also investigate with percentage of these thoughts are actually intrusive for samples. Considering that, 19% of the EMA surveys reported FRITs, future research should also investigate strategies to combat food related intrusive thoughts to support college students struggling with these.

## References

Arnáez, S., García-Soriano, G., López-Santiago, J. and Belloch, A. (2021), Illness-related intrusive thoughts and illness anxiety disorder. *Psychology and Psychotherapy Theory Research Practice, 94: 63-80.* https://doi.org/10.1111/papt.12267

Barber, B. K. (1996). Parental psychological control: Revisiting a neglected construct. *Child Development*, *67*(6), 3296–3319. https://doi.org/10.2307/1131780

Berry, L.-M., Andrade, J., & May, J. (2007). Hunger-related intrusive thoughts reflect increased accessibility of food items. *Cognition & Emotion*, *21*(4), 865–878. https://doi.org/10.1080/02699930600826408

Bongers, P., Jansen, A., Havermans, R., Roefs, A., & Nederkoorn, C. (2013). Happy eating. The underestimated role of overeating in a positive mood. *Appetite*, *67*, 74–80. https://doi.org/10.1016/j.appet.2013.03.017

Burgess, A. M., Frost, R. O., & DiBartolo, P. M. (2016). Development and validation of the Frost Multidimensional Perfectionism Scale–Brief. *Journal of Psychoeducational Assessment*, *34*(7), 620–633. https://doi.org/10.1177/0734282916651359

Chao, A., Grilo, C. M., White, M. A., & Sinha, R. (2015). Food cravings mediate the relationship between chronic stress and body mass index. *Journal of health psychology*, *20*(6), 721–729. https://doi.org/10.1177/1359105315573448

Copeland, W. E., Bulik, C. M., Zucker, N., Wolke, D., Lereya, S. T., & Costello, E. J. (2015). Does childhood bullying predict eating disorder symptoms? A prospective, longitudinal analysis. *International Journal of Eating Disorders*, *48*(8), 1141–1149. https://doi.org/10.1002/eat.22459

Costa, S., Hausenblas, H. A., Oliva, P., Cuzzocrea, F., & Larcan, R. (2016). Maladaptive perfectionism as mediator among psychological control, eating disorders, and exercise dependence symptoms in habitual exerciser. *Journal of Behavioral Addictions*, *5*(1), 77–89. https://doi.org/10.1556/2006.5.2016.004

Clark, D. A., & Rhyno, S. (2005). Unwanted intrusive thoughts in nonclinical individuals: Implications for clinical disorders. In D. A. Clark (Ed.), *Intrusive thoughts in clinical disorders: Theory, research, and treatment* (pp. 1–29). The Guilford Press.

Deaver, C. M., Miltenberger, R. G., Smyth, J., Meidinger, A., & Crosby, R. (2003). An evaluation of affect and binge eating. *Behavior modification*, *27*(4), 578–599. https://doi.org/10.1177/0145445503255571

Diotaiuti, P., Girelli, L., Mancone, S., Valente, G., Bellizzi, F., Misiti, F., & Cavicchiolo, E. (2022). Psychometric properties and measurement invariance across gender of the Italian version of the Tempest self-regulation questionnaire for eating adapted for young adults. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.941784

Erskine, J. A. K. (2008). Resistance can be futile: Investigating behavioural rebound. *Appetite*, *50*(2-3), 415–421. https://doi.org/10.1016/j.appet.2007.09.006

Ferreira, C., Pinto-Gouveia, J., & Duarte, C. (2013). Self-compassion in the face of shame and body image dissatisfaction: Implications for eating disorders. *Eating Behaviors*, *14*(2), 207–210. https://doi.org/10.1016/j.eatbeh.2013.01.005

Freeston, M. H., Gagnon, F., Ladouceur, R., Thibodeau, N., Letarte, H., & Rhéaume, J. (1994). Health-related intrusive thoughts. *Journal of psychosomatic research*, *38*(3), 203–215. https://doi.org/10.1016/0022-3999(94)90116-3

Frost, R.O., Marten, P., Lahart, C. *et al.* The dimensions of perfectionism. *Cognitive Therapy Research* 14, 449–468 (1990). https://doi.org/10.1007/BF01172967

Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The Eating Attitudes Test: Psychometric features and clinical correlates. *Psychological Medicine*, *12*(4), 871–878. https://doi.org/10.1017/s0033291700049163

Hayes, J. A., Lockard, A. J., Janis, R. A., & Locke, B. D. (2016). Construct validity of the Self-Compassion Scale-Short Form among psychotherapy clients. *Counselling Psychology Quarterly*, *29*(4), 405–422. https://doi.org/10.1080/09515070.2016.1138397

Hetherington, M., Rolls, B. J., & Burley, V. J. (1989). The time course of sensory-specific satiety. *Appetite*, *12*(1), 57–68. https://doi.org/10.1016/0195-6663(89)90068-8

Lombardo, C., Cerolini, S., Alivernini, F. *et al.* Eating self-efficacy: validation of a new brief scale. *Eating and Weight Disorders* 26, 295–303 (2021). https://doi.org/10.1007/s40519-020-00854-2

Macht, M., & Simons, G. (2000). Emotions and eating in everyday life. *Appetite*, *35*(1), 65–71. https://doi.org/10.1006/appe.2000.0325

Mann, T., & Ward, A. (2001). Forbidden fruit: Does thinking about a prohibited food lead to its consumption? *International Journal of Eating Disorders*, *29*(3), 319–327. https://doi.org/10.1002/eat.1025

May, J., Andrade, J., Kavanagh, D., & Penfound, L. (2008). Imagery and strength of craving for eating, drinking, and playing sport. *Cognition & Emotion*, *22*(4), 633–650. https://doi.org/10.1080/02699930701446296

May, J., Andrade, J., Kavanagh, D.J. *et al.* Elaborated intrusion theory: A cognitive-emotional theory of food craving. *Current Obesity Reports* 1, 114–121 (2012). https://doi.org/10.1007/s13679-012-0010-2

Meule, A., Hermann, T., & Kubler, A. (2014). A short version of the Food Cravings Questionnaire Trait: The FCQ-T-Reduced. *Frontiers in Psychology*, *5*. https://doi.org/10.3389/fpsyg.2014.00190

Meule, A., Teran, C. B., Berker, J., Gründel, T., Mayerhofer, M., & Platte, P. (2014). On the differentiation between trait and state food craving: Half-year retest-reliability of the Food Cravings Questionnaire-Trait-Reduced (FCQ-T-Reduced) and the Food Cravings Questionnaire-State (FCQ-S). *Journal of Eating Disorders*, *2*(1). https://doi.org/10.1186/s40337-014-0025-z

Mroczek, D. K., Stawski, R. S., Turiano, N. A., Chan, W., Almeida, D. M., Neupert, S. D., & Spiro, A., 3rd (2015). Emotional reactivity and mortality: Longitudinal findings from the VA normative aging study. *The journals of gerontology. Series B, Psychological sciences and social sciences*, *70*(3), 398–406. https://doi.org/10.1093/geronb/gbt107

Oliver, G., Wardle, J., & Gibson, E. L. (2000). Stress and food choice: a laboratory study. *Psychosomatic medicine*, *62*(6), 853–865. https://doi.org/10.1097/00006842-200011000-00016

Oliver, K. G., & Huon, G. F. (2001). Eating-related thought suppression in high and low disinhibitors. *International Journal of Eating Disorders*, *30*(3), 329–337. https://doi.org/10.1002/eat.1092

Polivy, J., & Herman, C. P. (1993). Etiology of binge eating: Psychological mechanisms. In C. G. Fairburn & G. T. Wilson (Eds.), *Binge eating: Nature, assessment, and treatment* (pp. 173–205). Guilford Press.

Purdon, C. (2004). Empirical investigations of thought suppression in OCD. *Journal of Behavior Therapy and Experimental Psychiatry*, *35*(2), 121–136. https://doi.org/10.1016/j.jbtep.2004.04.004

Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2010). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy*, *18*(3), 250–255. https://doi.org/10.1002/cpp.702

Rhee, K.E., Pan, T.Y., Norman, G.J. *et al.* Relationship between maternal parenting and eating self-efficacy in overweight children when stressed. *Eating and Weight Disorders* 18, 283–288 (2013). https://doi.org/10.1007/s40519-013-0043-x

Richard, A., Meule, A., Reichenberger, J., & Blechert, J. (2017). Food cravings in everyday life: An EMA study on snack-related thoughts, cravings, and consumption. *Appetite*, *113*, 215–223. https://doi.org/10.1016/j.appet.2017.02.037

Rivas, T., Bersabé, R., Jiménez, M., & Berrocal, C. (2010). The Eating Attitudes Test (EAT-26): reliability and validity in Spanish female samples. *The Spanish journal of psychology*, *13*(2), 1044–1056. https://doi.org/10.1017/s1138741600002687

Roncero, M., Perpiñá, C., & García-Soriano, G. (2011). Study of obsessive compulsive beliefs: relationship with eating disorders. *Behavioural and cognitive psychotherapy*, *39*(4), 457–470. https://doi.org/10.1017/S1352465811000099

Salkovskis, P. M., & Harrison, J. (1984). Abnormal and normal obsessions: A replication. *Behaviour Research and Therapy, 22*(5), 549–552. https://doi.org/10.1016/0005-7967(84)90057-3

Schumacher, S., Kemps, E., & Tiggemann, M. (2017). Acceptance- and imagery-based strategies can reduce chocolate cravings: A test of the elaborated-intrusion theory of desire. *Appetite*, *113*, 63–70. https://doi.org/10.1016/j.appet.2017.02.012

Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual review of clinical psychology*, *4*, 1–32. https://doi.org/10.1146/annurev.clinpsy.3.022806.091415

Shingleton, R. M., Eddy, K. T., Keshaviah, A., Franko, D. L., Swanson, S. A., Yu, J. S., Krishna, M., Nock, M. K., & Herzog, D. B. (2013). Binge/purge thoughts in nonsuicidal self-injurious adolescents: An ecological momentary analysis. *International Journal of Eating Disorders*, *46*(7), 684–689. https://doi.org/10.1002/eat.22142

Soetens, B., & Braet, C. (2006). 'The weight of a thought': Food-related thought and suppression in obese and normal-weight youngsters, *Appetite, 46, 309–317*. https://doi.org/10.1016/j.appet.2006.01.018

Turk, F., & Waller, G. (2020). Is self-compassion relevant to the pathology and treatment of eating and body image concerns? A systematic review and meta-analysis. *Clinical psychology review*, *79*, 101856. https://doi.org/10.1016/j.cpr.2020.101856

van Strien, T., Cebolla, A., Etchemendy, E., Gutiérrez-Maldonado, J., Ferrer-García, M., Botella, C., & Baños, R. (2013). Emotional eating and food intake after sadness and joy. *Appetite*, *66*, 20–25. https://doi.org/10.1016/j.appet.2013.02.016

Watson, D., & Clark, L. A. (1994). The PANAS-X: Manual for the Positive and Negative Affect Schedule - Expanded Form. *University of Iowa*. https://doi.org/10.17077/48vt-m4t2

Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality, 62*(4), 615–640. https://doi.org/10.1111/j.1467-6494.1994.tb00311.x

Wells, A., & Morrison, A. P. (1994). Qualitative dimensions of normal worry and normal obsessions: a comparative study. *Behaviour research and therapy*, *32*(8), 867–870. https://doi.org/10.1016/0005-7967(94)90167-8

Wenzel, K. R., Weinstock, J., Vander Wal, J. S., & Weaver, T. L. (2014). Examining the role of negative urgency in a predictive model of bulimic symptoms. *Eating Behaviors*, *15*(3), 343–349. https://doi.org/10.1016/j.eatbeh.2014.04.014

Whiteside, U., Chen, E., Neighbors, C., Hunter, D., Lo, T., & Larimer, M. (2007). Difficulties regulating emotions: Do binge eaters have fewer strategies to modulate and tolerate negative affect? *Eating Behaviors*, *8*(2), 162–169. https://doi.org/10.1016/j.eatbeh.2006.04.001

## Appendix

### Experience with Food Related Intrusive Thoughts (FRITs)-Baseline

Q34 On a typical day, how often do you have **thoughts about food** when <u>not</u> eating or snacking?

- ○ Almost Never (1)
- ○ Once in a while (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Very Often (5)
- ○ Almost constantly (6)

---

Q42 When do these food related thoughts happen?

- ☐ Before eating (1)
- ☐ After eating (2)
- ☐ When looking at oneself in the mirror (3)
- ☐ In a social context (4)
- ☐ Independent of a specific situation. (5)
- ☐ Another specific event (please specify) (6) _____

---

Q41 When you have thoughts about food (when not eating or snacking) **how vivid are these thoughts**? That is, to what degree can you see/touch/taste/hear/smell the food "in your mind?"

- ○ Not very vivid (1)
- ○ Somewhat vivid (2)
- ○ Moderately vivid (3)
- ○ Extremely vivid (4)

Q36 When you have thoughts about food (when not eating or snacking) **how much do you try to suppress or "push away" these thoughts**?

- ○ Not at all (1)
- ○ A little bit (2)
- ○ A moderate amount (3)
- ○ A great deal (4)

Q38 When you have thoughts about food (when not eating or snacking) **how uncontrollable do the thoughts seem**? In other words, how much do they keep coming back even if you don't want to have them?

- ○ Not at all uncontrollable (1)
- ○ A little bit uncontrollable (2)
- ○ Moderately uncontrollable (3)
- ○ Extremely uncontrollabe (4)

Q40 When you have thoughts about food (when not eating or snacking) **how much does it feel like you must act on them?**

- ○ Not at all (1)
- ○ A little bit (2)
- ○ Moderately (3)
- ○ Extremely (4)

Q40 When you have thoughts about food (when not eating or snacking) **how distressed or bothered are you by these thoughts**?

- ○ Not at all distressed (1)
- ○ A little bit distressed (2)
- ○ Moderately distressed (3)
- ○ Extremely distressed (4)

Rate your experience with intrusive thoughts about the following topics and **feel free to elaborate about your experience in the box below each topic:**

| | 1= I have never had this thought (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) | 8= I have this thought frequently throughout the day (8) |
|---|---|---|---|---|---|---|---|---|
| Dieting (1) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Exercise (2) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Body image (3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Purging (4) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Taking laxatives for weight loss (5) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Fasting related to weight loss (6) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cosmetic surgery related to weight loss (7) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Weight loss or weight gain supplements (8) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bloating (9) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Gut health as it impacts body shape (10) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not being able to stop eating (11) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Body checking (repeated checking of one's weight or shape) (12) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Certain food item(s) (Please elaborate below) (13) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Other relevant food related intrusive thoughts (Please elaborate below) (14) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Experience with Food Related Intrusive Thoughts (FRITs)- EMA**

Q13 Are you eating right now or have you been eating in the last few minutes?

○ No (1)

○ Yes (2)

Just before you responded to the survey were you thinking about food or snacks at that moment?

○ Yes (1)

○ No (2)

*Skip To: If Just before you responded to the survey were you thinking about food or snacks at that moment? = No*

What food related thought were you thinking?

_____

Rate you desire to consume the food or snack you are thinking about

- 1= Not at all (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5= Extremely (5)

Rate how much you were trying to suppress your thought

- 1= Not at all (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5= Extremely (5)

Q12 Rate how difficult it is to control your thought

- 1= Not at all (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5= Extremely (5)

How vividly can you imagine the food in terms of your senses

| | 1 = No image present at all and you only 'know' that you are thinking of the object (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 = Perfectly clear and as vivid as the actual experience (7) |
|---|---|---|---|---|---|---|---|
| Touch/texture (1) | | | | | | | |
| Smell (2) | | | | | | | |
| Sound (3) | | | | | | | |
| Visuals (4) | | | | | | | |
| Taste (5) | | | | | | | |

What do you think prompted this thought?

_____

How distressing is your food related thought?

- ○ 1= Not distressing at all (1)
- ○ 2 (2)
- ○ 3 (4)
- ○ 4 (5)
- ○ 5= Extremely distressing (6)

*

Enter the number of hours since eating

_____

Enter the number of times you have had a food related thought since the last survey

_____